Library Progress International *Print version ISSN 0970 1052*
Vol.44 No.3, Jul-Dec 2024: P.3487-3500 *Online version ISSN 2320 317X*

Original Article *Available online at www.bpasjournals.com*

Teaching Geography with Active Learning (EDJA) as an example

Fatima Issa Jabr[1], Prof. Dr. Thana Yahya Qasim Al-Hasso[2]

fatima.eesa2204m@ircedu.uobaghdad.edu.iq

thanaa.yehya@ircoedu.uobaghdad.iq

College of Education - Ibn Rushd for Human Sciences / University of Baghdad

How to cite this article: Fatima Issa Jabr, Thana Yahya Qasim Al-Hasso (2024) Teaching Geography with Active Learning (EDJA) as an example. *Library Progress International*, 44(3), 3487-3500.

Abstract

The current study aimed to find out the impact of the EDJA model on the achievement of geography among fifth grade literary students and achieve the objectives of the current study, and the researchers followed the steps of the semi-experimental approach and divided them into two groups, the first group is the experimental group that received teaching according to the IDGA model, and the other group is the control group that received teaching using the lecture method. Achieving equality between the two research groups through equality, Before starting the experiment, the researchers were keen to achieve equality between the two study groups through chronological age in months, parents' scores, and tests of intelligence and previous knowledge. It was limited to building an achievement test to measure the achievement level of the experimental students, who numbered (70) students, by building (40) test items, of which (30) were objective items and the rest were articles. Appropriate psychometric properties, including validity and stability, as well as difficulty, discrimination and effectiveness of identified alternatives have been demonstrated. After satisfaction with the test, its characteristics, the experiment and its internal and external integrity, the experiment is approved. In practice, the study reached the following results: The results were as follows:

1. There is a statistically significant difference between the experimental group that uses the IDGA model in teaching and the control group that uses lectures in teaching.
2. The average score of the experimental group students is higher than the average score of the control group students, which has a statistically significant impact.

Keywords: Impact of the model (EDJA), geography, fifth grade literary students.

Introduction

First: the research problem

Despite the progress made in the field of teaching methods, our education at all levels, especially in the preparatory stage, is in dire need of development through research on the effectiveness of modern educational methods, models and strategies that may have an effective and tangible impact in keeping pace with scientific and technical progress, achieving the desired educational goals, developing thinking and positive attitudes towards the material, as well as increasing achievement, a goal that education must strive to achieve. (Alhasso, 2010: 445) (Al-Hasso, 2010, 445).

In light of the clear low levels of academic achievement of secondary school students in various subjects, which is more prominent in the middle school, as the success rate reached (37%) and this is what was diagnosed by a study (Ahmed and Sahib, 2012: 1-31) (Ahmad and Sahib, 2012: 1-31), the researcher tried to visit a number of preparatory schools, and meet with schools of geography in them, and directed them to an exploratory questionnaire (Appendix 6), as they confirmed the weak levels of their students in this subject, the literature and previous studies have indicated many The reasons that could be the reason for the low achievement, as (AL-Samarrai, 2002) confirms that the methods of teaching geography need further development, as most of its teachers still adopt traditional methods of teaching (AL-Samarrai, 2000: 33) (AL-SAMARAI, 2000: 33), while the study (AL-ZUBAIDI, 2012) and (AL-ZUBAIDI, 2012) and (Al-Faili, 2014) (AL-FAILI, 2014)) that the traditional method is still prevalent in our schools and that the diversification of teaching methods by geography teachers was relatively weak, with a weakness in their ability to take into account the individual differences among their students (AL-ZUBAIDI, 2012) (AL-ZUBAIDI, 2012) (AL-FAILI, 2014) (AL-FAILI, 2014).

Second: The importance of research

The current era is characterized by rapid developments and changes, which included various frameworks of knowledge and science, and this led to a civilizational shift that includes all fields, as it created a number of contemporary data that need a special type of expertise, skills and ideas to deal with them appropriately, as this civilizational shift is only a reflection of the explosion of knowledge and science with its various advanced technologies and within the transformations affecting the environment of the educational system; Therefore, it is necessary to provide a new education far from traditional methods to keep pace with the challenges of the new era, and to prepare individuals who are able to face changes and challenges within modern scientific methods developed professionally and academically, in addition to reconsidering again the educational systems in terms of their concept, content, style and strategies used, in order to base them on scientific foundations and principles commensurate with the material and human capabilities available in educational organizations (Mohammed, 2017: 76) (Mohammed, 2017: 76).

Teaching models give us an opportunity to be clearer and more precise about the implicit education that learners receive from education as a whole, they enable us to expand construction methods and thus expand the learners' mental experience in school (AlKhaza'leh, et al., 2011: 296), and they provide opportunities for the development of the cognitive, emotional, skill, social and moral aspects of learners (Qatami and Nayfa, 2002: 12) (Qatami, and Naifa, 2002: 12).

One of these models is the Edja model and its theoretical basis is due to constructivist theory, where the International Dictionary of Education defined it as: "a vision in the theory of learning and learner growth based on the fact that the learner is active in building his thinking patterns as a result of the interaction of his innate abilities with experience" (Zaytoun and Zaytoun, 1992: 1) (Zaytoun and Zaytoun, 1992: 1).

Al-Khalidi (2013) pointed out that constructivist theory is a theory of education based on attention to the individual's activity and behavior within the school, and this means that the individual through his effort and interaction with the environment in which he lives leads to building new experiences and developing old experiences (Al-Khalidi, 2013: 31) (Al-Khalidi, 2013: 31).

The importance of this model in providing learners with concepts that are difficult to understand, especially abstract concepts that are difficult to learn through traditional teaching methods, when good planning, effective implementation and the availability of the appropriate educational environment are available, and it also works to develop different types of thinking, the most important of which is problem solving. (Al-Musayyab Foundation for Human Development.2021).

It also highlights its importance in that it studies man in the past and present in terms of his relations with man as an individual and a member of a group, and in terms of his relations with the environment in which he lives, as well as the events and problems that arose and arise from those relationships (Al-Hasso, 1992: 10).

The scope of geography has expanded in the current era and its achievements have acquired new qualities and its importance has become more than all that has been achieved in any previous era and scientific progress has become one of the characteristics that characterize human societies, and there is no doubt that the changes that have occurred in society have been reflected in the curricula of social subjects in general and the approach of geography in particular in terms of its books and methods, which by its nature deal with the study of man and his relationship to the environment, and to keep pace with this development, specialists and researchers had to update and develop their skills and knowledge To keep pace with these changes both in content and in teaching methods (Abu Sarhan, 2000: 222) (Abu Sarhan, 2000: 222).

The urgent need for science and follow-up of academic achievement has emerged through the great and effective role of science in the life of the individual and society at all levels, and in various directions, as the importance of academic achievement and its benefits appear on the personality of the individual. The importance of academic achievement appears through its upward rise, as it prepares the individual to occupy a good job position in most cases, as scientific colleges prepare their students for professions that still occupy the top of the professional structure, and by virtue of their history, the nature of work in them, the advantages they grant and the status they give to the worker in them, make Students are more determined and more willing to enroll, regardless of whether they are consistent with their abilities, aptitudes, and inclinations (Nofal, 2001: 98) (Nofal, 2001: 98).

There is no doubt that academic achievement has a great impact on the student's personality, as academic achievement makes the student recognize the reality of his abilities and potentials, and the student's access to an appropriate achievement level in his study of various subjects instills confidence in himself and supports his idea of himself, and keeps away from anxiety and tension, which strengthens his mental health, as for the student's failure to achieve the appropriate academic achievement for his study subjects, it leads him to lose confidence in himself and a sense of frustration and inferiority and to stress and anxiety, and this is one of the pillars of bad Mental health of the individual.

The researcher chose the preparatory stage to conduct her research as it is important in preparing students and encouraging them to rely on themselves in research, exploration, follow-up and continue studying in other important and vital stages that contribute to the preparation of human resources that support the labor market and then walk them towards the

university stage, which requires moving to it to provide them with the scientific direction and develop their ways of thinking and provide them with various skills that help them face problems (Aziz, 2006: 25) (Aziz, 2006: 25).

Based on the above, it can be said that the importance of the current research is reflected in the following:

1. The importance of using modern teaching models, methods and methods in the education process, as they work to improve and develop education.
2. The importance of the EDGE model in making the learner the focus of the educational process, as it highlights the positive course in thinking and finding appropriate solutions to problems based on his previous experience.
3. This study can be a positive contribution added to the educational field, which is a modest attempt that may benefit the competent authorities, especially the Ministry of Education, in improving and developing the educational process.
4. The novelty of the subject of the study, as far as the researcher knows there is no previous study that dealt with the impact of the EDGA model in referring fifth grade literary students in geography.
5. The importance of geography as it contains information, concepts and ideas that expand and develop the capabilities of learners and provide them with the necessary knowledge that enables them to understand and adapt to their environment.
6. This study contributes to the development of teaching models for geography and adds to teachers an interesting method in teaching geography that keeps pace with scientific progress in teaching methods and strategies.
7. The importance of the preparatory stage as the stage of forming the student's personality and building information on it.

Third: The objective and hypothesis of the research

This research seeks to identify the impact of the EDJA model on the achievement of geography among fifth grade literary students. By verifying the following hypothesis:

- There is no statistically significant difference at the level of significance (0.05) between the average scores of the students of the experimental group who study geography in the EDGA model and the average scores of the control group students who study geography in the traditional way of achievement.

Fourth: Research Limits

The current research is determined by:

1. Fifth grade literary students in government preparatory and secondary day schools for girls in Baghdad Governorate for the academic year 2022-2023.
2. The content of the book Natural Geography for the fifth grade of literature to be taught by the Ministry of Education in the Republic of Iraq, authored. Mr. Daashour Al-Aali, Mr. Muhammad Khader Al-Samarrai, et al., Revised Eighth Edition.

Fifth: Definition of terms

The researcher identified the terms contained in the title of the research, which are:

First: Impact: Defined by:

- (Al-Hanafi, 1991): "The amount of change that occurs in the dependent variable after it is exposed to the influence of the independent variable" (Al-Hanafi, 1991, 253).
- (Shehata and AL-Najjar, 2003): "The outcome of a desirable or undesirable change that occurs in the learner as a result of the learning process" (Shehata and AL-Najjar, 2003, 22).
- **Procedural definition:** The ability of the EDGA model in which the students of the experimental group of the research sample study to achieve satisfactory results in raising their achievement in geography.

Second: EDJA model: defined by:

- Razouki, **2016:** "It is a constructivist educational model based on presenting the educational situation cooperatively by provoking an educational problem that the student is guided to solve analogously using his previous experience (Razouki**, 2016: 126)** (**Razouki, 2016: 126**).
- **(Al-Awaini, 2021): "This model is an integration of the most important principles of** educational theories, and learning occurs better as learners deal with problems that increase their motivation towards learning through their attempts to find a solution to these problems collaboratively" (**Al-Awaini, 2021: 1) (Al-Awaini, 2021: 1**).
- **Procedural definition:** An educational model adopted by the researcher in teaching the students of the experimental group of the research sample and is based on the cooperative educational learning position by provoking an educational problem, and directing students to solve it in a cooperative manner according to their previous experiences according to the steps (excitement, dialogue, clarification, application).

Third: Collection: Defined by:

- **(Dasoqe, 1988): "Knowledge and skill when measured." (Dasoqe, 1988: 27).**
- **(Abu Jado, 1998) (**Abu Jado, 1988**):** "It is the outcome of what the learner learns after a certain period of time, and it can be measured by the degree obtained by an achievement test." (Abu Jado, 1998): 469) **(**Abu Jado, 1988: 469**).**
- (Eyada, 2001**):** "that level reached by the student in his achievement of school subjects." (Clinic, 2001: 146) **(**Eyada, 2001: 146**).**
- (Allam 2006**):** "The degree or level of success achieved by a student in a particular field of study." (Allam, 2006)(Allam, 2006: 122**).**
- **Procedural definition:** It is "the achievement achieved by the fifth grade literary students of the research sample measured by the grades they obtain after responding to the achievement test prepared by the researcher and applied at the end of the experiment.

Fourth: Geography: Defined by:

- **(Al-Laqani, 1991) is the study of man's relationship with his natural environment and the ways in which he does it and provokes that interaction (Al-Laqani, 1991: 24**).
- **(Abu Sarhan, 2000) (**Abu Sarhan, 2000**): It is the study of the earth's** surface and its natural phenomena and the relations of influence between it and man (Abu Sarhan, 2000: 28**)** (**Abu Sarhan, 2000: 28**).
- **(Abu Dayyeh, 2011) (Abu Dayyeh, 2011**): **Study the land and environments and the relationships between them combined and teach people to understand and taste the mosaic composition of the worker in which they live (** Abu Dayyeh, 2011: 49) (Abu Dayyeh, 2011: 49**).**
- **Procedural definition:** The topics included in the first three chapters of the textbook taught by the students of the two research groups during the experiment period and determined by the Ministry of Education for the fifth grade of literary for the academic year 2023-2024.

Fourth: Literary Fifth:

The definition of the fifth grade of middle school in the secondary school system in Iraq as: It is the second grade of the preparatory stage in the education system in Iraq in the scientific and literary branches, as the duration of the study is three years to mediate between the fourth and sixth grades of middle school and represents the preparatory stage for university study.

Chapter Two: Research Methodology and Procedures:

This chapter describes the research methodology and procedures, including the selection of the experimental study design, the determination of the study population and sample, the equivalence of the two study groups, the internal and external validity of the design, the procedures for applying the experiment, the identification of the scientific material, the formulation of work objectives, the preparation of the research plan, and the construction of research tools.

First: Research Methodology:

To reach the goal of the research, the researcher relied on the experimental method because it is the appropriate approach for research that aims to study the impact of an independent variable in a dependent variable, as experimental research exceeds the limits of quantitative description of the phenomenon, and rises to address certain variables under controlled conditions to verify how they occur in experimental research.

Second: Experimental Design:

To choose the appropriate experimental design for the research is of great importance because it ensures the proper structure of the research and access to results that can be relied upon in answering the problem of the study and verify its hypotheses The researcher has relied in this research on one of the experimental designs with partial control, which is the design of the control group with a post-test and since the goal of this research ((The impact of the EDGA model in the collection of geography among fifth grade students of theliterary)), which requires that Two experimental and control groups, where the experimental group is studied according to the EDGA model and the control group is taught in the traditional way, and Figure (1) illustrates this.

Figure 1 Experimental Design of Research

Test Type	Dependent variable	Independent variable	The Collection
Post	Collection In geography	EDGA model	Experimental
		————————	Adjuster

Third: Research Community:

The community is defined as: "the sum of the elements through which the researcher tries to generalize the results related to a phenomenon or problem", and through this is the identification of the research community is the framework that the researcher refers to in choosing his sample and be a large or small community, and the research community may consist of fifth grade literary students in preparatory and secondary government day schools for girls in the General Directorate of Education of Baghdad (Karkh III), which numbered (59) school, dividedTo (18) numbers and (41) secondary.

Fourth: Research Sample:

Since it is impossible to randomly select the research sample and distribute it to the experimental and control groups directly from members of society, anddue to the nature of the educational system, so researchers may resort to choosing people from the target grade in the study and then choosing one school to be a field for experimentation, and this is what the researcher did, as she chose secondary (Sanabel Al-Khair)) to be a field for conducting the current research experiment where the researcher visited the school mentioned before the start of the experiment to prepare lists of the names of fifth grade literary students (research sample) under the book to facilitate the task (Appendix 1), and this school has chosen to be: It contains two divisions for the fifth grade literary and the readiness of the school administration to cooperate with the researcher in conducting the experiment, the researcher identified this school, anddistributed these two divisions randomly to the experimental and control groups The number of students in these two divisions was (35, 35) students respectively, after excluding the failed students from them because they gained previous experience, and by (5, 5) respectively, the number of students for each group of experimental and control groups became (30) students and table (1) shows that.

Table (1) Number of members of the two research groups before and after exclusion

Number of students after exclusion	Number of failed students	Number of female students before exclusion	Division	The Collection
30	5	35	A	**Experimental**
30	5	35	in	**Adjuster**

Fifth: Statistical equivalence between the experimental and control groups:

Before starting the research experiment, the researcher limited the statistical equivalence between the students of the two research groups in a number of variables that are believed to have an impact on the integrity of the experiment and the accuracy of the results, as follows:

1- The chronological age of the students calculated by the consultation: The researcher calculated the ages of the students of the research sample until the day of the start of the research experiment and it turned out that the average age of the experimental group students (196.77) months and a standard deviation (15.409) and the average age of the control group was (198.67) months and a standard deviation (18.971).

To find out the significance of the difference between these two averages using the T-test (T – test) for two independent samples, it was clear that the difference was not statistically significant at the level of significance (0.05) as the calculated T value (0.426) was smaller than the tabular T value of (000, 2) and with a degree of freedom (58) and Table (2) shows this and this result confirms that the experimental and control groups are equivalent to the chronological age variable.

Table (2) Arithmetic mean, standard deviation, calculated and tabular T-value For the ages of female students For the two search groups calculated in months

Significance Level (05, 0)	T-value		Degree of freedom	Standard deviation	Arithmetic mean	Sample size	The Collection
	Tabular	Calculated					
Non-function	000، 2	0.426	58	15.409	196.77	30	Experimental
				18.971	198.67	30	Adjuster

2- Grades of the final exam for the previous year in geography: After the researcher obtained the grades of the final exam for the fourth grade of middle school in geography for students of the experimental and control groups (Appendix 12), it turned out that the average scores of the experimental group students (83.93) and standard deviation (12.340) and the average score of the control group (79.87) and standard deviation (13.741) and to find out the significance of the difference between these two averages the researcher used the T test (T – test)) for two independent samples, it turned out that the difference was not statistically significant at the level of (0.05) as the calculated T value for the

significance of the difference (1.206) was smaller than the tabular T value (2,000) with a degree of freedom (58) as shown in Table (3) and this result confirms that the experimental and control groups are equivalent in this variable.

Table (3) The arithmetic mean, standard deviation, calculated and tabular T value for the previous year's scores in the geography of the two research groups

Significance Level (05, 0)	T-value		Degree of freedom	Standard deviation	Arithmetic mean	Sample size	The Collection
	Tabular	Calculated					
Non-function	000، 2	1.206	58	12.340	83.93	30	Experimental
				13.741	79.87	30	Adjuster

3- **Intelligence test:** The researcher relied on the (Raven) test for intelligence, which was designed to measure mental ability, it may consist of (60) questions, and the question is a sentence with four possible answers, and the test was conducted on the students of the two groups (experimental and control) on 12-10-2023, and the researcher prepared an answer sheet distributed with the test and corrected each question once for each question (Appendix 10), It is clear that the average scores of the experimental group (45.97), with a standard deviation of (9.807), while the arithmetic mean of the control group was (45.60) and a standard deviation of (7.981) and using the T-test for two independent samples to find out the significance of the difference between the averages of the two groups, it was found that the difference is not statistically significant at the level of (0.05) as the calculated T value (0.159) was smaller than the tabular T value (2,000) And with a degree of freedom (58) and this indicates that the experimental and control groups are equivalent in this variable as shown in Table (4).

Table No. (4) Arithmetic mean, standard deviation, calculated and tabular T-value For female students' grades The two research groups in the intelligence test

Significance Level (05, 0)	T-value		Degree of freedom	Standard deviation	Arithmetic mean	Sample size	The Collection
	Tabular	Calculated					
Non-function	000، 2	0.159	58	9.807	45.97	30	**Experimental**
				7.981	45.60	30	Adjuster

Sixth: The impact of the experiment procedures:

The researcher tried to control this factor through the following procedures:

A. **Subject: The** subjects included in the first three chapters of the book "Physical Geography" to be taught to the fifth grade of literary were taught to students of the experimental and control research groups.

B. **School:** The researcher herself studied the two research groups during the experiment period from Sunday, 15/10/2023 until 10/1/2024

E. **Distribution of classes:** To adjust this variable, the researcher agreed with the school administration about the symmetrical distribution of classes, and the researcher studied (6) classes per week so that the two groups take lessons on the same day in order to avoid the occurrence of lessons on a day off and as shown in Table (5).

Table (5) Distribution of Quotas to the Experimental and Control Groups

Time	Quota	today	The Collection
8:00	The first	Sunday	Experimental
8:45	The second		Adjuster
9:40	Third	Tuesday	Adjuster
10:35	Fourth		Experimental
8:00	The first	Thursday	Experimental
8:45	The second		Adjuster

F. **Confidentiality of the research:** For the purpose of controlling this variable, the researcher agreed with the school administration not to tell the students the nature of the task they perform, by telling them that they are a school within the school staff in order to ensure that the experiment proceeds normally to reach accurate results.

G. **Classroom environment:** This research was applied to the students of one school, as the students of the two research groups were selected from the same school, and the same conditions in terms of capabilities and classroom environment, thus controlling this variable.

Seventh: Research Requirements:

For the purpose of achieving the objectives of the research and its hypotheses, it was necessary to prepare the research requirements as follows:

1. **Determining the scientific material:** In light of the requirements of the experiment and the nature of the research, the scientific material of the experiment was the first three chapters of the book (Natural Geography) to be taught for the fifth grade of literature for the academic year 2023-2024, and Table (6) shows that

Table (6) Content of the first three chapters of the book (Physical Geography)

Number of pages	Chapter Content	Chapter
28	Earth's surface forms	The first
38	Weather and climate	Second
28	Hydrology	Third

2. **Formulation of behavioral goals:** The behavioral goal is a phrase or sentence that describes the final product of the teaching process, and is formulated in the form of observable and measurable performance and represents the behavioral goal of trying to learn or curriculum by clarifying the changes that are determined by the events of the student and the process of setting behavioral goals helped in designing the educational process and turning it into an organized process and intended behavior. (Atallah, 2009: 74) (Atallah, 2009: 74).

3. Preparing teaching plans: Lesson planning is a necessary procedure to achieve good teaching, which should take into account the nature of learners, taking into account the available capabilities and means. (Al-Tanawi, 2008: 352) (Al-Tanawi, 2008: 352). The teaching plan is the set of steps, procedures and measures taken by the teacher to implement the lesson. (Obeidat, 2007: 9) (Obaidat, 2007: 9).

Eighth: Research Tool:

The nature of the current research and its objectives require the availability of a tool for it, which is the achievement test in geography for fifth grade literary students, and the following is an explanation of the procedure for building the achievement test, and for the lack of a test to measure academic achievement in geography after the completion of the current research experience, the researcher found it necessary to prepare this test in line with the nature of the research and its objectives, because the achievement test is one of the most common evaluation tools used in measuring student achievement, as it is an organized procedure to determine the amount of what students have learned.(Melhem, 2000: 194) (Melhem, 2000: 194).

The process of preparing this test has gone through the following steps and procedures:

1- Determining the goal of the test: When designing any test, the designer should pre-determine the goal that he seeks to achieve from it to fit his procedures with this goal, so it is the first and important step that the test designer should think about and determine first (Al-Nabhan, 2004: 72) (Al-Nabhan, 2004: 72), and therefore the goal of this test is to measure the achievement of material among the students of the experimental group and control after the completion of the experiment through:

2- Determining the levels of test: After consulting the opinions of specialists in measurement and evaluation and methods of teaching geography, the researcher considered that the achievement test should include measuring the first five levels of Bloom's classification of the cognitive field, namely (knowledge, understanding, application, analysis and synthesis), due to its suitability to the nature of cognitive development of fifth stage literary students.

3- Preparation of the specification table (test map): In order for the test questions to cover the topics of the subject, and the levels of specific behavioral goals and according to their importance, the specification table should be prepared, which is the main pillar on which the researcher relies in preparing the achievement test, because it ensures the selection of a representative sample of the paragraphs that measure the behavioral goals, as well as the disclosure of the validity of the test in measuring the extent of internal consistency, and the extent of its representation of the topics of the scientific material (Abdulhadi, 2002: 107-108)Abdel Hadi, 2002: 107-108), and on this basis, the researcher prepared the test map in the light of the analysis of the content of the study material and the behavioral objectives of the first three

chapters of the book Natural Geography for the fifth grade of literature, which was prepared by the researcher according to the levels (knowledge, understanding, application, analysis, synthesis) and table (7) shows the number of these goals and their levels according to the chapters covered by the research experience.

Table (7) Test map of the ratios of the importance of the chapters and the importance of the levels of objectives

Total	Installation 7%	Analysis 13%	Application 20%	Understanding 24%	Knowledge 36%	Chapter
47	4	6	9	11	17	Chapter One
51	4	7	10	12	18	Chapter Two
47	4	6	9	11	17	Chapter Three
145	12	19	28	34	52	Total

4- Determining the number of test paragraphs and distributing them to the proportions of the test map: The researcher found it appropriate that the number of achievement test paragraphs (40) items in order to match its length with the time allocated for the answer and covers an appropriate area of topics and objectives, and the number of test paragraphs has been distributed to the topics and objectives according to the proportion of their importance and according to the following steps:

1- The relative importance of each chapter was extracted according to the number of goals received in each chapter: Importance Ratio

$$\text{Relative importance of the class} = \frac{\text{Number of goals per semester}}{\text{Total number of goals}} \times 100$$

2- Extracting the relative importance of cognitive levels

$$\text{Relative importance of level} = \frac{\text{Number of goals per level}}{\text{Total number of goals}} \times 100$$

3- Determining the number of total paragraphs of the test by (40) items

4- By determining the number of total paragraphs, the number of paragraphs for each chapter was extracted from the experiment using the equation:

$$\frac{\text{Total number of paragraphs} \times \text{relative importance for each chapter}}{100} = \text{a. Number of paragraphs per chapter}$$

$$\frac{\text{The number of paragraphs in each chapter} \times \text{the relative importance of the level}}{100} = \text{B.Number of paragraphs per level}$$

5- Test Validity:

A- **The apparent honesty of the test:** Although the logical analysis of paragraphs may sometimes be misleading because it depends on the subjective opinions of experts, but it is necessary at the beginning of its preparation because it reveals the extent to which the paragraph is ostensibly related in its formulation to the property prepared to measure it, as any paragraph whose apparent form does not indicate the property that measures it should be excluded. (Al-Kubaisi, 2001: 171) (Al-Kubaisi, 2001: 171), so the researcher presented the paragraphs with the content to be measured (behavioral objectives) and the study material to a group of experts (arbitrators) specialized in teaching methods, measurement and evaluation (Appendix 20) and asked them to examine the paragraphs logically and estimate their validity to measure the content prepared for measurement.

B- **Content veracity:** It is the design of the test so that it covers all parts of the scientific material taught by students in a particular class without neglecting any part of it and covers the educational goals that should be achieved, and the sincerity of the content can be verified by preparing a table of specifications (test map) and the researcher has prepared its test in the light of the test map and your effort to verify the truthfulness of the content.

6- Exploratory experiment to calculate time and clarity of paragraphs: In order to verify the clarity of the test instructions to the respondent and the extent of understanding of its paragraphs and phrases, the test was applied on (8/1/2024) to (25) students of the fifth grade of literature in (Al-Jahiz High School), and the researcher asked them to answer the test in front of her, that is, it was possible to point out aspects of ambiguity or lack of understanding, and it became clear through this application that the instructions are clear and the paragraphs are understandable, and that the

average approximate time to answer is about (55) minutes This time represents the range between the first and last student to answer the test.

7- Exploratory experiment to calculate stability and psychometric properties: The statistical analysis of paragraphs is more important than logical analysis because it reveals the ability of the content of the paragraph to measure what was prepared to measure by verifying the indicators and psychometric properties of the paragraph and that the most important of these characteristics is the coefficient of difficulty of the paragraph and the coefficient of discrimination, and after applying the test to this sample and correcting the answers and calculating the grades for each paragraph and each individual, the sample members ranked from the highest total degree to the lowest total degreeThe number of members of each group (27) students, then the researcher calculated the psychometric properties of the paragraphs as follows:

A- Paragraph difficulty coefficient: It means the level of complexity that the student faces in the correct answer to the test paragraph and whether it is high or medium. The degree of difficulty is determined in light of the percentage of those who answered the wrong answer for that paragraph or question and when calculating the difficulty coefficient for each paragraph of the test found that it ranges between (0.38-0.73) Table (8) and found (9). The difficulty coefficients were acceptable because the paragraph difficulty coefficient is considered acceptable if it ranges between (20, 0 – 80, 0) (Bloom, 1983: 104), as shown in the following table:

Table (8) Coefficient of difficulty of the objective paragraphs of the post-achievement test

Coefficient of difficulty	Paragraphs	Coefficient of difficulty	Paragraphs
0.44	21	0.43	1
0.73	22	0.47	2
0.53	23	0.48	3
0.63	24	0.52	4
0.45	25	0.60	5
0.54	26	0.39	6
0.45	27	0.54	7
0.54	28	0.57	8
0.43	29	0.50	9
0.46	30	0.38	10

Table (9) Difficulty coefficient of essay paragraphs for the post-achievement test

Coefficient of difficulty	Paragraphs	Coefficient of difficulty	Paragraphs
0.56	31	0.55	11
0.45	32	0.49	12
0.50	33	0.40	13
0.50	34	0.49	14
0.54	35	0.59	15
0.48	36	0.62	16
0.65	37	0.44	17
0.54	38	0.58	18
0.63	39	0.64	19
0.50	40	0.52	20

B- Paragraph discrimination coefficient: The paragraph discrimination coefficient indicates its ability to detect the individual differences on which psychological and educational measurement is based (Manse, 1988: 184) (Manse, 1988: 184), as the paragraph should at least distinguish between those with higher and lower levels of individuals in relation to the characteristic or phenomenon measured by the paragraph (Ebel, 1972, p. 399) (Apple, 1972: 399), because the purpose of calculating the coefficient of discrimination is to exclude paragraphs that do not distinguish between upper and lower levels, or to modify and try them again, while retaining the distinct paragraphs (Ghiselli, et al, 1981, p. 434) (Ghisli, 1981: 434) The two extreme groups are usually determined by the total score of 27% if the sample is very large, and this percentage increases as the sample size is smaller to 50% in small samples. (Return, 137):1998) (Odeh, 1998: 137), so the researcher arranged the scores of the members of the sample of paragraph analysis of (100) students from the highest degree to the lowest degree and identified the upper and lower groups by 50% in each group and used the equation of distinguishing paragraphs with a binary answer (true, false) (Crocker and Algina, 2009: 417) (Crocker and Algina, 2009: 417) All paragraph discrimination coefficients were acceptable, and the discriminatory power was calculated for

each paragraph of the test and the results ranged between (0.39-0.54), preferably the paragraph discrimination coefficient (0.30) or more, see Table (10).

Table No. (10) Paragraph Discrimination Coefficient

Discrimination coefficient	Paragraphs	Discrimination coefficient	Paragraphs
0.40	21	0.40	1
0.40	22	0.39	2
0.39	23	0.40	3
0.43	24	0.39	4
0.50	25	0.43	5
0.40	26	0.40	6
0.43	27	0.54	7
0.40	28	0.49	8
0.40	29	0.43	9
0.39	30	0.49	10

C- Psychometric properties of the test: Specialists in measurement emphasize the importance of the psychometric properties of the test, which are indicators of its accuracy in measuring what was developed to measure it with the least possible errors (Rabie, 1994: 39) (Rabie, 1994: 39), and honesty and stability are among the most important psychometric properties of the test emphasized by the theory of measurement, which should be available to a good degree. (Abdurrahman, 1998: 159) (Abdul Rahman, 1998: 159).

Tenth: Statistical Methods:

The researcher used a number of statistical means to process the data and information obtained from the research sample and show the results she reached, namely:

1. T-test for two independent samples

This test used the equivalence of the research variables: (chronological age - intelligence - the rate of the previous year - previous knowledge) between the members of the experimental and control groups.

$$\text{ت} = \frac{Q1 - Q2}{\sqrt{\frac{1}{N2} + \frac{1}{N1}} \times \frac{(N1-1)\,v21 + (n2-1)\,v22}{N1 + N2 - 2}}$$

Whereas:

v = calculated T value.

Q1 = arithmetic mean of the first group.

Q2 = mean of the second group.

N1 = sample of members of the first group.

N2 = sample of members of the second group.

p21 = variance for the first group.

p22 = variance for the second group.

1. **Paragraph difficulty equation:** This equation was used to identify the degree of difficulty of the achievement test paragraphs:

$$\text{Paragraph difficulty} = \frac{\text{Kh K}}{\text{nun}}$$

Whereas:

FS = Number of wrong answers in all sample members.

n = sample group of individuals.

2. **Paragraph discrimination equation:** This equation was used to find the discrimination of the paragraphs of the achievement test

$$\text{Paragraph difficulty} = \frac{\text{pp} - \text{r d}}{\text{N1}}$$

Whereas:

p y = the number of correct answers in the top set.

p d = the number of correct answers in the lower set.

n1 = the number of students in either group.

(Al-Imam, 1990: 111-112) (Al-Imam, 1990: 111-112)

3. **Effectiveness of alternatives:** Used to calculate the effectiveness of incorrect (wrong) alternatives to the achievement test items.

$$\text{Effectiveness coefficient of alternatives} = \frac{pp - r\,d}{N1}$$

Whereas:

p p = Number of students in the top group who chose the wrong alternative.

R D = Number of students in the lower group who chose the wrong alternative.

n1 = number of members of one of the two groups. (Nabhan, 2004: 204) (al-Nabhan, 2004: 204)

4. **Chi-square to calculate parity in the academic achievement of the mother and father.**
5. **Cronbach's alpha equation:**

Used to calculate the stability coefficient of the achievement test.

$$d = \left(\frac{N}{N-1}\right)\left(1 - \frac{\text{nun}}{\text{P2S}}\right) - \text{Mug A2 N}$$

Whereas:

Mg2 n = the sum of the variance for each test item.

p2 x = variation of answers to each paragraph in the test.

n = number of test paragraphs. (Ahmann.J,1971:311) (Ahman, 1971: 311)

Chapter Three: Conclusions, Recommendations and Proposals

Conclusions

In light of the results of the research, the following conclusions can be drawn:

1. The effect of the EDGA model in increasing the achievement level of geography by enhancing the multiple cognitive aspects of fifth grade literary students.
2. The use of the EDGA model helped the students of the experimental group of the research sample to consolidate information in their minds, and focuses on the positive learners and their active participation, and this is in line with the directives of modern education.

Recommendations

In light of the results of the research, the researcher recommends the following:

1. Urging the directorates of education and geography teachers by the supervisors of specialization on the need not to rely on memorization and indoctrination in teaching geography among middle school students in order to catch up with the scientific development of teaching methods, and the need to adopt modern and contemporary teaching models and strategies, especially those built according to constructivist theory.
2. Benefiting from the results of the current study in developing the geography curriculum for the preparatory stage.

propositions

To complement the current research, the researcher proposes to conduct the following researches:

1. A study similar to the current study in subjects and stages of study.
2. A study to show the effect of the EDGA model on other variables such as achievement motivation, orientation towards geography, and development of basic science processes.
3. A study showing the effect of EDGA modeling on the acquisition of geography according to the gender variable.

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